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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/912,041 | 07/24/2001 | Lingyi A. Zheng | MTI-31470 | 4539 |

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| EXAMINER | |
|---|---|
| KENNEDY, JENNIFER M | |
| ART UNIT | PAPER NUMBER |
| 2812 | |

DATE MAILED: 02/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/912,041 | ZHENG, LINGYI A. | |
| | Examiner | Art Unit | |
| | Jennifer M. Kennedy | 2812 | |

*-- The MAILING DATE of this communication appears on the cover sh et with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *15 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-91 and 125-136* is/are pending in the application.

4a) Of the above claim(s) *See Continuation Sheet* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5, 9-17, 20-23, 30-31, 36-43, 47-52, 55-58, 60-65, 72-76, 78, 80-83, 85, 87-88, 90, 125-126, 128, 130-132, 134-136* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:



Continuation of Disposition of Claims: Claims withdrawn from consideration are 6-8,18,19,24-29,32-35,44-46,53,54,59,66-71,77,79,84,86,89,127,129 and 133.

### *Election/Restrictions*

Applicant's election without traverse of claims 1-5, 9-17, 20-23, 30-31, 36-43, 47-52, 55-58, 60-65, 72-76, 78, 80-83, 85, 87-88, 90, 125-126, 128, 130-132, 134-136 in Paper No. 8 is acknowledged.

Claims 6-8, 18-19, 24-29, 32-35, 44-46, 53-54, 59, 66-71, 77, 79, 84, 86, 89, 127, 129, and 133 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected embodiment, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 8.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 9-10, 1-17, 20-23, 30-31, 36-39, 41-42, 47-52, 60-62, 64, 72-74, 76, 78, 80, 125-126, 128, 130, 132, and 134 rejected under 35 U.S.C. 102(e) as being anticipated by DeBoer (U.S. Patent No. 6,326,277).

DeBoer discloses the method of forming a uniform nitride dielectric layer over a nitride resistive material (14) and a nitride receptive material (34), the method comprising the steps of:

implanting a surface-modifying agent into exposed surfaces of the nitride resistive material (see Figure 6, column 7, lines 44-50);

forming the nitride dielectric layer (50, see column 9 lines 42-50) on the nitride resistive material and the nitride receptive material, whereby the surface-modifying agent provides for formation of the uniform thickness of the nitride dielectric layer over the nitride resistive material and the nitride receptive material.

Further, DeBoer discloses the method wherein the surface-modifying agent comprises an ionizable nitrogen or silicon material, a nitrogen-containing gas (see column 7, lines 44-52), implanting at a low angle implantation of about 60-85 degrees from vertical (see column 8, lines 40-52), the implantation implants the nitride resistive material layer within the container opening and at the corners of he container opening (see Figure 6).

Further DeBoer discloses the method wherein the nitride resistive material comprises an insulative material including borophosphosilicate glass (see column 5, liens 55-57), wherein the nitride receptive material (34) comprises a semiconductive material comprising hemispherical grain silicon.

Finally, DeBoer also discloses the method wherein a upper electrode is formed (50) over the nitride layer.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11, 40, and 65 rejected under 35 U.S.C. 103(a) as being unpatentable over DeBoer (U.S. Patent No. 6,326,277).

DeBoer discloses the method as claimed and rejected above, but does not disclose the implantation dosage. The selection of the implantation dosage is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. In re Jones, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and In re Boesch, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious).

Claims 5 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeBoer (U.S. Patent No. 6,326,277) in view Gardner et al. (U.S. Patent No. 5,783,469).

DeBoer et al. discloses the method as claimed and rejected above, but does nto disclose the method wherein the nitrogen containing gas is trifluoronitride. Gardner et al. disclose the method of utilizing either nitrogen or trifluoronitride as a implant species (see column 5, liens 64-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize trifluoronitride as the implant gas rather than nitrogen because as Gardner et al. teach the gases are art recognized equivalents.

Claims 55-58, 63, 75, 81-83, 85, 87-88, 90, 131, and 135-136 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeBoer (U.S. Patent No. 6,326,277) in view Hosaka (U.S. Patent No. 5,118,636).

DeBoer et al. discloses the method as claimed and rejected above, but does not disclose the method wherein the substrate is rotated during implant. Hosaka discloses the method of rotating a substrate during implantation (see column 1, lines 35-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to rotate the substrate during implantation in order to prevent the shadowing effect.

Further, in response to Claim 57, DeBoer in view of Hosaka disclose the method as claimed and rejected above, but does not disclose the implantation dosage. The selection of the implantation dosage is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. In re Jones, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and In re Boesch, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Kennedy whose telephone number is (703) 308-6171. The examiner can normally be reached on Mon.-Fri. 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (703) 308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

jmk
February 21, 2003

John F. Niebling
Supervisory Patent Examiner
Technology Center 2800